## Isolation of Rutin from *Hydrangea Paniculata*, Var. *Grandiflora Sieb.*

By James F. Couch and Joseph Naghski

Rutin, 3,5,7,3′,4′-pentahydroxyflavone-3-rutinoside, has recently assumed some prominence in the treatment of increased capillary fragility associated with hypertension[1,2] and is promising as a remedy for certain other diseases resulting from capillary breakdown. Rutin has been found in thirty-three species of plants and is, thus, one of the most widely distributed of the glucosides. This paper reports the isolation and identification of rutin in the flowers of a common garden species of *Hydrangea*. Previous chemical examinations of the roots of white-flowered species of *Hydrangea* have been reported.[3,4,5] Hashimoto and Kawana[6] extracted the dried flowers of *H. paniculata* with benzene and obtained a phenolic substance, $C_9H_6O_3$, but they do not mention rutin. The presence of rutin in relatively large quantities in the flowers has not previously been reported.

**Experimental.**—Fresh blossoms (67.5 g., moisture, 83.6%) were digested with alcohol (300 ml.) for several hours. The solvent was removed from the filtered extract. The residue was freed from fats and resins with benzene and the insoluble matters were extracted with boiling water. On cooling and standing, 0.4 g. of rutin crystallized, m. p. 183–185°; raised by recrystallization from boiling water to 190–192°. A further crop, 0.05 g., was obtained by re-extracting the insoluble matters with boiling water; yield, 0.45 g. or 4.06% of the moisture-free plant.

*Anal.*[7] Calcd. for $C_{27}H_{30}O_{16}$: C, 53.10; H, 4.95. Found: C, 53.34; H, 5.09.

The substance gave the usual tests for the identification of rutin. These data were confirmed on a larger sample (1.6 kg.) of fresh flowers.

(1) J. Q. Griffith, J. F. Couch and M. A. Lindauer, *Proc. Soc. Exp. Med. Biol.*, **55**, 228–229 (1944).

(2) J. F. Couch and C. F. Krewson, United States Department of Agriculture, Mimeograph Circular AIC-52, July, 1944.

(3) C. S. Bondurant, *Am. J. Pharm.*, **59**, 122–124 (1887).

(4) A. G. Leubert, *ibid.*, **70**, 550–552 (1898).

(5) H. J. M. Schroeter, *ibid.*, **61**, 117–118 (1889).

(6) A. Hashimoto and T. Kawana, *J. Pharm. Soc. Japan*, **55**, 183–186 (1935); *C. A.* **29**, 5112 (1935).

(7) C and H determinations by C. L. Ogg.

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